City of Attleboro, Massachusetts

DEPARTMENT OF WASTEWATER
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Discharge Monitoring Reports (OES4-SMR)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Attention: David Turin

This letter is a follow up to our telephone conversation on April 27, 2012. The following events prompted us to meet with Metalor; the industry that we believe has been compromising our nitrification process at the Attleboro wastewater treatment plant. As you know we are under an Order for Compliance (Docket No. 10-013) from the EPA to meet a total nitrogen limit of 8 mg/l. As a result the City has invested approximately $750,000 to design and construct a full scale nitrogen pilot plant utilizing existing aeration equipment along with the installation of addition new equipment and instrumentation. The nitrogen pilot plant went into operation in November of 2011. Since that time various process changes have been made to our system in order to meet the total nitrogen (TN) limit, however it has been determined that our plant BOD loading is not sufficient as a carbon source to convert the nitrate to nitrogen gas, which in turn would bring down the TN. With that said, we have been in the process of acquiring an additional carbon source to introduce into our nitrification/anoxic reactors. We met with Environmental Operating Solutions (EOS), a company that markets a chemical called Micro-C, a proven carbon source that is specifically designed to convert nitrate to nitrogen gas. This product was bench tested using actual mixed liquor from our treatment process which showed favorable results, however before we make the investment of a 4000 gallon holding tank with containment and the necessary pump and piping, we want to try the Micro-C in our process on a larger scale to determine whether it would be successful under actual conditions. We went ahead and purchased 4 totes of Micro-C at 237 gallons per tote, this would be approximately a four day supply of chemical; however it would be enough time to determine whether it will do the job. In addition, we advertised for bids and EOS was awarded the bid to supply Micro-C once our trial testing is proven.

Just to give you some history regarding our treatment plant, nitrification has never been a problem for us unless our process is inhibited by an outside source. For over thirty years we have operated our aeration system or bio reactors in an aerobic “contact stabilization mode”, which is a very robust mode of operation that has the ability to sustain certain slug loads that may enter our facility and also handles them better than the traditional method of the “complete mix mode”. For your reference, in the contact stabilization mode one bio reactor tank is dedicated to return activated sludge (RAS) only, which is highly concentrated with healthy microorganisms before any incoming plant wastewater flow is allowed to enter the bio reactor. In the complete mix mode the process changes whereas the contact stabilization tank is utilized as a complete mix bio reactor instead, the RAS and the incoming wastewater plant flow are mixed together in the same tank, eliminating a tank dedicated just to RAS, unfortunately the complete mix mode can’t handle slug loads in the amount that Metalor is sending us in the form of ammonia. We must use the complete mix mode in order for the plant to achieve TN removal. Recently we have noticed an increase in Metalor’s discharge for quality and quantity, which has had a noticeable effect on our treatment process in terms of maintaining complete nitrification. Please note that the concentration of ammonia that Metalor sends us is one third our daily loading from the entire City. As a result when we are in the complete mix mode we can’t operate our plant properly to achieve TN removal. This has been determined by data collected from the City’s treatment plant influent, Metalor’s discharge and the effect it has on the different operational modes that have been utilized at our treatment plant over the last few weeks. In addition, to make matters worse E. Sweet, one of our industrial users discharged a batch into the sewer containing cyanide forty times their allowable limit.

This wiped out our plant's nitrifying bacteria completely and caused an already elevated plant ammonia discharge to become much worse. At that point we had to switch our process back to a contact stabilization mode, fully aerobic and start again at square one to bring our plant back into total nitrification.

In conclusion, in order to effectively test the Micro-C to achieve TN removal the following schedule has been implemented with Metalor. Since Thursday April 26th our treatment plant has been running in a contact stabilization mode to achieve total nitrification. Total nitrification was achieved by Sunday April 29th. Metalor was contacted on Monday April 30th and given the following discharge schedule:

Starting Tuesday May 2nd at midnight Metalor cut back their discharge rate to 4 gallons per minute (gpm) over twenty four hours. This rate will continue through Saturday at midnight.

Attleboro will continue to monitor their ammonia levels through the weekend. If everything looks good we will start our Micro-C Sunday morning May 6th at approximately 9:00 AM.

Metalor will not be allowed to discharge any flow from Saturday May 5th through Wednesday May 9th. This should give the City enough time to test the Micro-C to evaluate if it will work in our full scale nitrogen pilot plant. If the results are favorable we will allow Metalor to resume discharging to the sewer on Wednesday May 9th, however if they discharge more than 4 gpm we would expect to see our ammonia discharge at the treatment plant rise and it most probably interfere with our ammonia removal.

I will keep you updated as we move forward.

Sincerely,

Paul A. Kennedy
Superintendent of Wastewater

Cc: David Burns, DEP
Justin, Pimpare, EPA
Robert Greene, DEP
Mayor Kevin J. Dumas
Barry LaCasse, Director of Budget & Admin.
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